

Program Overview December 2000



#### The NGNGV Program is Sponsored by



#### **U.S. Department of Energy**

Office of Transportation Technologies





**National Renewable Energy Laboratory** 

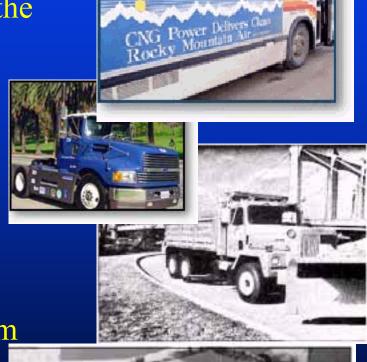


## Department of Energy: Investing in Clean Air Technologies

• DOE has invested significantly in heavy vehicle technologies in the last ten years

 These technologies have help make significant incremental advancements toward cleaner, more efficient vehicles

• DOE now wants to take a bold step in developing a new generation of advanced medium and heavy-duty natural gas vehicles





#### **Vision for the Future**

#### Develop one medium-duty (Class 3-6) CNG Vehicle by 2004









#### **Vision for the Future**

# Develop one heavy-duty (Class 7-8) LNG vehicle by 2004





### Why does DOE want to develop these new natural gas vehicles?

- Medium- and heavy-duty vehicles are the highest fuel users and significant contributors to NOx and PM emissions in urban areas
- This program will increase the vehicle platforms available to help Nonattainment Areas improve air quality
- Serious investment by **government and industry** is necessary to develop new vehicles and introduce them in the marketplace successfully
- Focused investment and encouragement by DOE can help introduce advanced technologies into the marketplace rapidly so their benefits can be realized



#### Vision and Goals for the Future

# One medium-duty (Class 3-6) CNG vehicle and one heavy-duty (Class 7-8) LNG vehicle will be available in 2004 that:

- \*\* Implement advanced DOE natural gas and heavy-vehicle technologies
- \* Implement high efficiency engine technology
- \* Implement step change in technology over current NG vehicles
- \*\* Have exhaust emission levels below proposed emission standards for 2007
- \*\* Are fully competitive with diesel vehicle counterparts in terms of performance and life-cycle economics
- **\*\*Are commercially viable**



#### Vehicle Development Timeline

2000 2001 2002 2003 2004 Prototype Vehicle Design, Development and Evaluation Establish Vehicle Working Group Develop design strategy and identify remaining technology obstacles Define duty cycle and performance specifications Complete R&D to overcome remaining obstacles Competitive solicitation for vehicle development Design and develop prototype vehicles Baseline Performance Testing **Emissions Testing** Accelerated Reliability Testing **Deployment** 



#### **Two Rounds of Research**

Round 1
FY2001
Enabling
Technologies

Round 2
FY2002
Prototype
Vehicles



#### **Two Rounds of Research**

Round 1 FY2001

Enabling Technology

Round 1

technology R&D that...

- is close to completion
- could be completed with a relatively short, focused research effort
- could be made commercially viable in the 2004 time frame
- overcomes current barriers to natural gas vehicle introduction

# Two Rounds of Research Round 2

Development of two prototype vehicles to be put in service in on-road development in 2004.

- Class 3-6 CNG Vehicle
- Class 7-8 LNG Vehicle

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#### Finding the Balance....





#### **Program Strategy**

- Commercial success will require
  - an economically attractive vehicle,
  - a broad customer base and
  - a stable fueling and maintenance infrastructure
- Chassis and engine OEMs will want evidence of a market for these vehicles before they invest and support the program
- The vehicles must be built with industry participation and industry support
- Customers must be included in the development process from the very beginning



#### **Program Strategy**

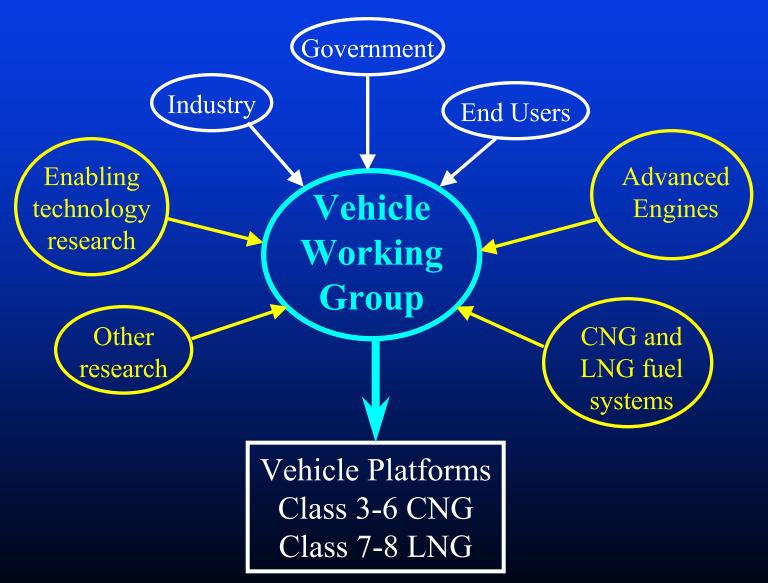
- DOE proposes a three-element strategy built on active involvement of key stakeholders:
  - 1) Conduct interactive workshops to identify most critical vehicle platforms needed
  - 2) Design, develop and evaluate prototype vehicles with the active involvement and support of OEMs and the gas industry through an Ad Hoc Vehicle Working Group

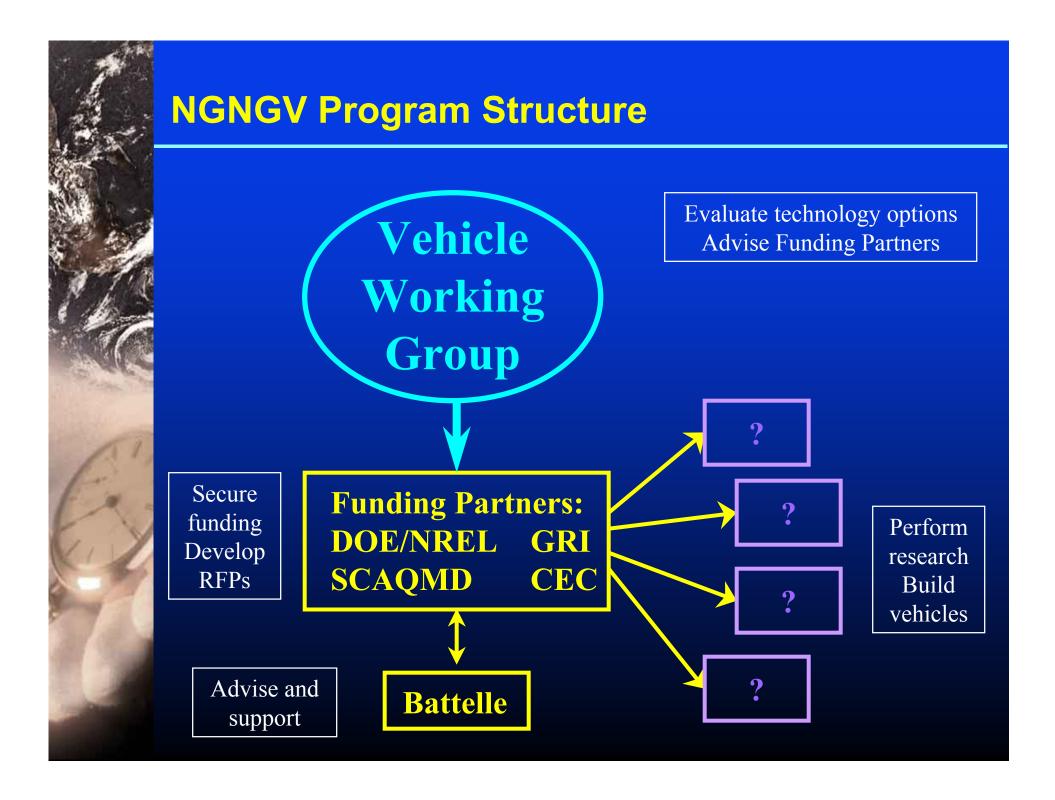


3) Coordinate enhancement of the fueling and maintenance infrastructure to ensure successful deployment and market growth

# Enabling research

#### **Program Integration**







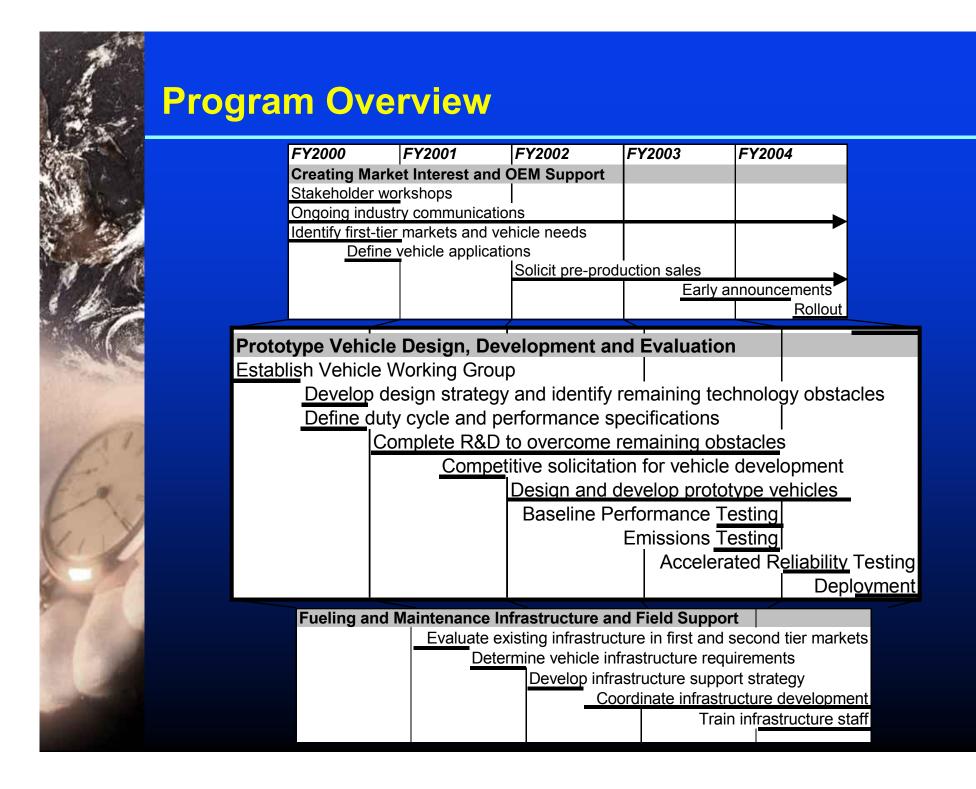
# Fueling and Maintenance Infrastructure and Field Support

Experience has shown that successful deployment and subsequent market growth requires

- Stable and reliable fueling infrastructure
- highly responsive maintenance and field support programs

For first vehicles we will coordinate enhancements of fueling and maintenance infrastructure including

- Evaluating existing infrastructure and determining needs
- Developing an infrastructure support strategy
- Coordinating enhancement activities
- Training the infrastructure and support personnel

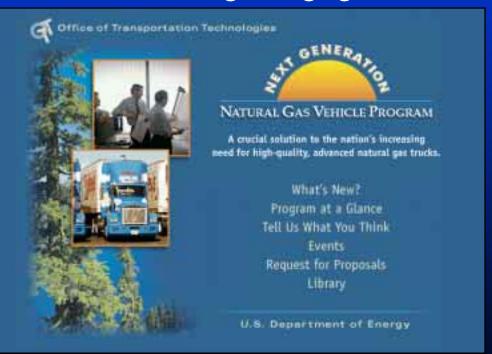




#### Where can I get more information?

For more information, including adding your name to the mailing list for meeting notices, updates, and notifications, visit our website\*:

www.ctts.nrel.gov/ngngv



<sup>\*</sup> Our updated website will be active January 1, 2001